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THE EFFECTS OF CONTRACTS WITH SELF-IMPOSED AND
EXTERNALLY-IMPOSED STUDY CONTINGENCIES ON THE
CHAPTER SCORES OF UNIVERSITY STUDENTS

An abstract of a thesis by
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The Problem. To compare the effects of contracts with self-imposed contingencies and with counselor-imposed contingencies on the study behavior and chapter scores of freshmen in a personalized psychology course.

Procedure. Eleven provisionally admitted university freshmen, who averaged below a C in Psychology I, made weekly schedules to study in the library and take chapter tests. Three types of schedules were investigated: schedules without contingencies, contracts with self-imposed contingencies, and contracts with contingencies imposed by the counselor.

Findings. The results showed that schedules with externally imposed contingencies were effective in altering study behavior, i.e. studying in the library and taking tests; but little change was demonstrated in the product of the behavior, i.e. chapter scores.

Conclusions. Studying, i.e. sitting quietly in the library with an open book, as defined in this study does not mean that effective study behavior such as reading or self-quizzing is occurring at the same time.

Recommendations. Contracts to improve academic performance must place contingencies on well defined and observed study behavior.

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CHAPTER I

INTRODUCTION

University counselors are frequently presented with two problems in their interactions with undergraduate students. Counselors must deal with deficits in students' study skills and counselors must motivate students to study a sufficient amount of time and at appropriate times. If counselees are enrolled in courses which are personalized, then counselors must also motivate students to schedule course activities efficiently. Personalized courses typically consist of various tests and activities which the students may complete whenever they choose (Keller, 1968). Procrastination is a problem in personalized courses. Students who crowd too many activities into the end of the semester may not have sufficient time to complete all of the course activities.

Study skills deficits may be corrected with the SQ3R method (Robinson, 1970). According to SQ3R the student first surveys chapter and subheadings to get a general idea of the material to be studied. Next the student formulates questions from the chapter headings. Then the student reads the material, recites the answers to the questions he formulated, and finally reviews the material. It has also been suggested that students restrict the number of places where they study in order to establish discriminative

stimuli for study behavior (Williams & Long, 1975).

Several solutions to the problem of motivating students to study enough have been suggested. It may be helpful if students schedule and then self-record studying (Williams & Long, 1975). Unfortunately little correspondence has been found between scheduled and actual studying. When students scheduled study time, monitoring showed that students seldom studied as scheduled (Sowers, Lloyd, & Lloyd, 1977; Neilsen, Lloyd, & Lloyd, Note 1; Cohen, 1975).

Since scheduling usually does not increase studying, it may be necessary to reinforce students for correspondence between scheduled and actual behavior. When a point contingency was placed on correspondence between scheduled and actual studying, studying increased for some students; however a close correspondence between scheduled and actual studying was not found across all students (Sowers et al., 1977; Neilsen et al., Note 1). It has also been suggested that instructors in personalized courses reinforce students for meeting the schedules they have set for completion of course activities (Glick, 1978).

Contingency contracts, agreements which stipulate reinforcers contingent on the performance of specified behaviors, have been used successfully to increase studying and have resulted in improved test scores in an Introductory Psychology course for below average college students (Bristol & Sloane, 1974). Contingency contracts appear to

be more effective when the student is involved in their formulation. The value of student input into behavior management plans was investigated with high-achieving high school students. Behavior management plans were divided into two categories, proclamations and contracts. A behavior proclamation was a plan devised without student input. A behavior contract was a plan drawn up jointly by student and counselor. A comparison of behavior proclamations and behavior contracts showed behavior contracts more effective in reducing disruptive behavior in the classroom (Williams, Long, & Yoakley, 1972).

Contingency contracts may involve external reinforcement or self-reinforcement. Rather than depending on external sources of reinforcement, it has been suggested that students reinforce themselves for completing study and activities schedules (Williams & Long, 1975). On the other hand, the practicality of self-reinforcement has been questioned due to the time required to teach students to use self-reinforcement procedures effectively (Glick, 1978).

In times of declining enrollment and a social philosophy of open admissions, many universities are accepting students who are relatively underprepared for college work. The university at which the present study was conducted dealt with the problem of study skills deficits by requiring that students attend a class which featured the SQ3R study method (Robinson, 1970). This study was concerned

with the problem of motivating students to schedule course activities and studying. The counselor and each student jointly prepared study and activities schedules. The effects of schedules without contingencies, with self-imposed contingencies, and with counselor-imposed contingencies on the study behavior and chapter scores of provisionally admitted freshmen in a personalized course were examined.

CHAPTER II

METHOD

Subjects

Subjects were provisionally accepted first-semester Drake University students who were enrolled in Psychology I. Provisionally accepted students have not met university entrance requirements, and are officially admitted into the University at the end of their first semester contingent on attaining a minimum grade point average of 2.0 for 10 credit hours. Eleven students whose grades in Psychology I averaged below a C (2.0) in the first three weeks of the semester participated in this study. Each student was asked to attend an individual weekly counseling session with the author. Weekly counseling is provided for all provisionally admitted students.

Examination Procedures

The progress of the eleven students was monitored in Psychology I, an individualized introductory course, in which multiple-choice chapter tests were available for students to take at their own pace provided they stayed ahead of six test deadlines distributed throughout the semester. Students could take as many as three similar tests over each of ten chapters. Tests could be taken until 85% was earned on one test. The total score for each chapter was a sum of the points earned on each test taken.

A description of Psychology I is in Appendix A.

Dependent Variables

The following measures were obtained for each student weekly: 1) Number of minutes spent studying Psychology I in the library; 2) number of tests taken for each chapter; 3) number of test points earned (scores); 4) number of class lectures and films attended; 5) number of total points earned.

Observation Procedures

Students were requested to study in a designated room on the third floor of the Drake University library. Each 15-minutes, a monitor recorded if each student was present and studying. Studying was defined as being seated at a table or desk, awake, silent, and with Psychology I study materials open.

Information on the number of tests passed, class lectures and films attended, and total points earned was provided by a weekly computer printout of student progress in Psychology I.

Experimental Conditions

The treatment was implemented according to a multiple baseline design.

Baseline. Progress of the students in Psychology I was monitored. Any student who scored less than 7 points

for each of two consecutive chapter tests or who failed to take a test for two consecutive weeks was entered into treatment condition 1. This criterion was used in all condition changes.

Condition 1, Scheduling. During the weekly counseling session, each student filled out a weekly schedule for Psychology I that specified the amount of time the student would study Psychology I in the university library, the tests he or she would take, and the lectures and films he or she would attend. This schedule was revised each week. Appendix B contains a sample of the scheduling form.

Condition 2, Student-Devised Contingency Contracting. Each student in this condition filled out and signed a contingency contract which specified the same behaviors that were stipulated in scheduling; however, in addition, the student selected a positive and an aversive contingency to be presented by him/herself or another person for completion or noncompletion of the contracted behaviors. If another person was involved in the contracted contingencies, he/she also signed the contract. Appendix B contains a sample of the contingency contract form.

Condition 3, Counselor-Devised Contingency Contracting. This condition was the same as Condition 2, except that the counselor provided the aversive contingency. If the student did not fulfill the terms of the contract, a copy of the contract was sent to the student's parents with

a letter which described the reasons for the contract and informed the parents that the student had not fulfilled its conditions.

Reliability

An independent observer separately recorded studying for each student on the same schedule as the monitor. Percent agreement was obtained by dividing the number of agreements by the number of agreements plus disagreements, times 100. Reliability was recorded on studying in the library six times. Mean percentage agreement for the six sessions was 98%.

CHAPTER III

RESULTS

The effects of the three experimental interventions on the summed test scores, i.e. the chapter scores, for each student are shown in Figures 1, 2, 3, and 4. The abscissa indicates the days the testing center was open. A chapter score is plotted on the day the last of three possible tests for that chapter was taken. Weeks that students followed their schedules are indicated by a closed triangle. Weeks that students failed to follow their schedules are indicated by an open triangle. Arrows indicate points at which the counselor devised aversive consequence was carried out.

The upper panel of Figure 1 shows chapter scores of Students 1 and 2. These students' data are shown together because their performance in baseline and scheduling was similar. In Condition 1, Scheduling, the mean test scores of both Students 1 and 2 were slightly higher than baseline, one point higher for Student 1 and one and one half points higher for Student 2. When these students earned less than seven points on a chapter during scheduling, they were then entered into Condition 2, Student-Devised Contingency contracting. The chapter scores of Student 2 were always more than 7 in this condition. Student 1 earned 0 points on the second chapter of this condition and was entered into Condition

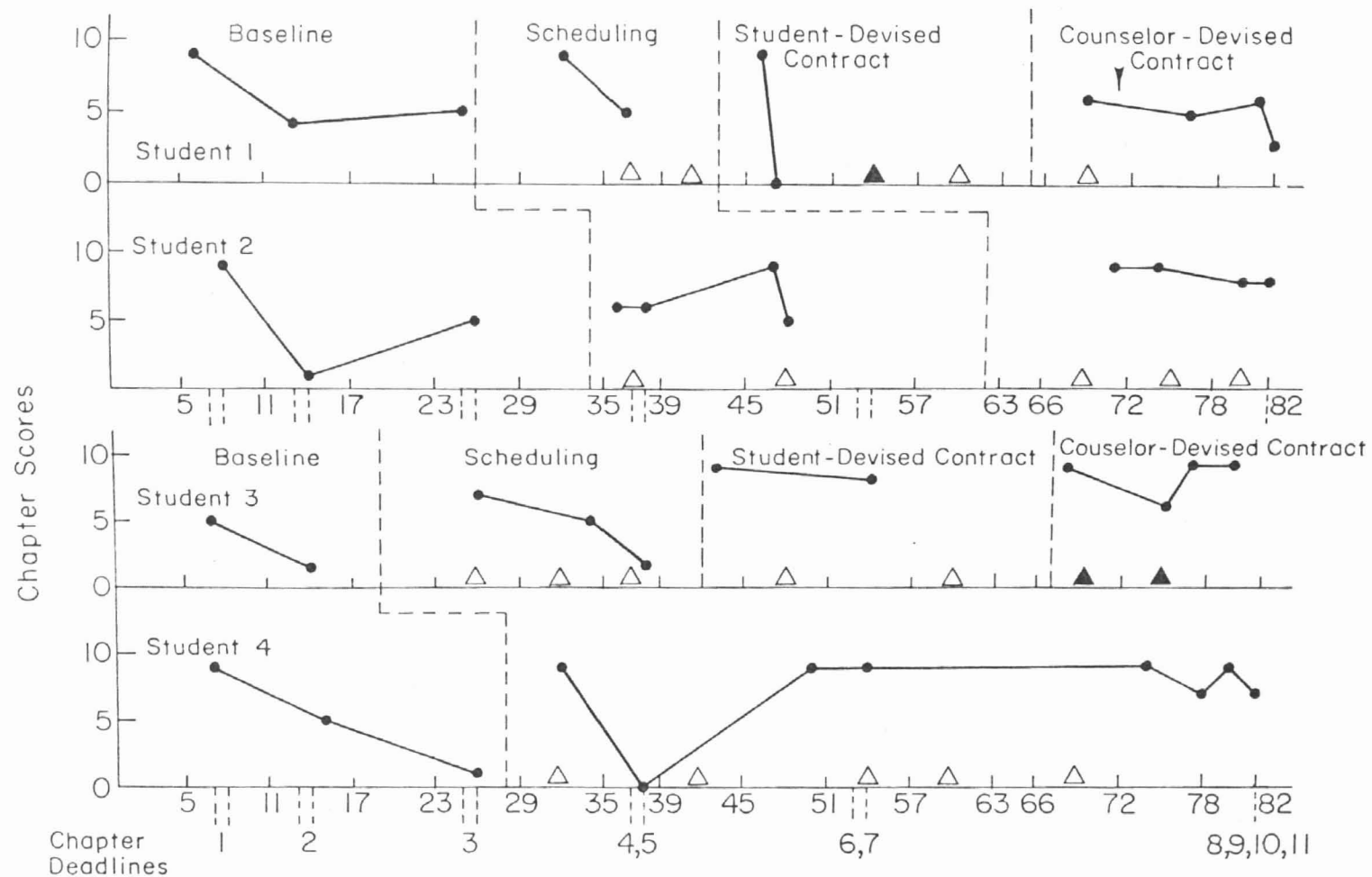


Figure 1. Total chapter scores plotted on the last day a test was taken over a given chapter as a function of baseline, scheduling, student-devised contingency contracts, and counselor-devised contingency contracts conditions with provisionally admitted university freshmen. Δ = agreement not kept, ▲ = agreement kept, ▼ = the aversive consequence.

3, Counselor-Devised Contingency Contracting. Student 1 did not earn a score of 7 points before or after the aversive consequence was carried out on day 71.

The lower panel of Figure 1 shows chapter scores of Students 3 and 4 who had similar mean scores and a decreasing trend in scores in baseline. When Student 4 entered the scheduling condition, his chapter scores improved and he remained in this condition throughout the remainder of the semester. The chapter scores of Student 3 increased in the scheduling condition initially but then fell to baseline levels. When this student entered Condition 2, Student-Devised Contingency Contracting, his mean chapter scores improved; but he failed to complete one test per week and entered Condition 3, Counselor-Devised Contingency Contracting. He resumed test-taking and maintained a mean score of 8.5 per chapter.

Figure 2 shows chapter scores of Students 5, 6, and 7, who had similar scores in baseline and scheduling. Condition 2, Student-Devised Contingency Contracting, did not substantially improve the chapter scores of these three students. When Condition 3, Counselor-Devised Contingency Contracting, was introduced, all four chapter scores of Student 5 exceeded 7 points; and two of the three chapter scores for Student 6 exceeded 7 points.

Figure 3 shows chapter scores of Students 8, 9, and 10. After baseline these students took tests regularly and

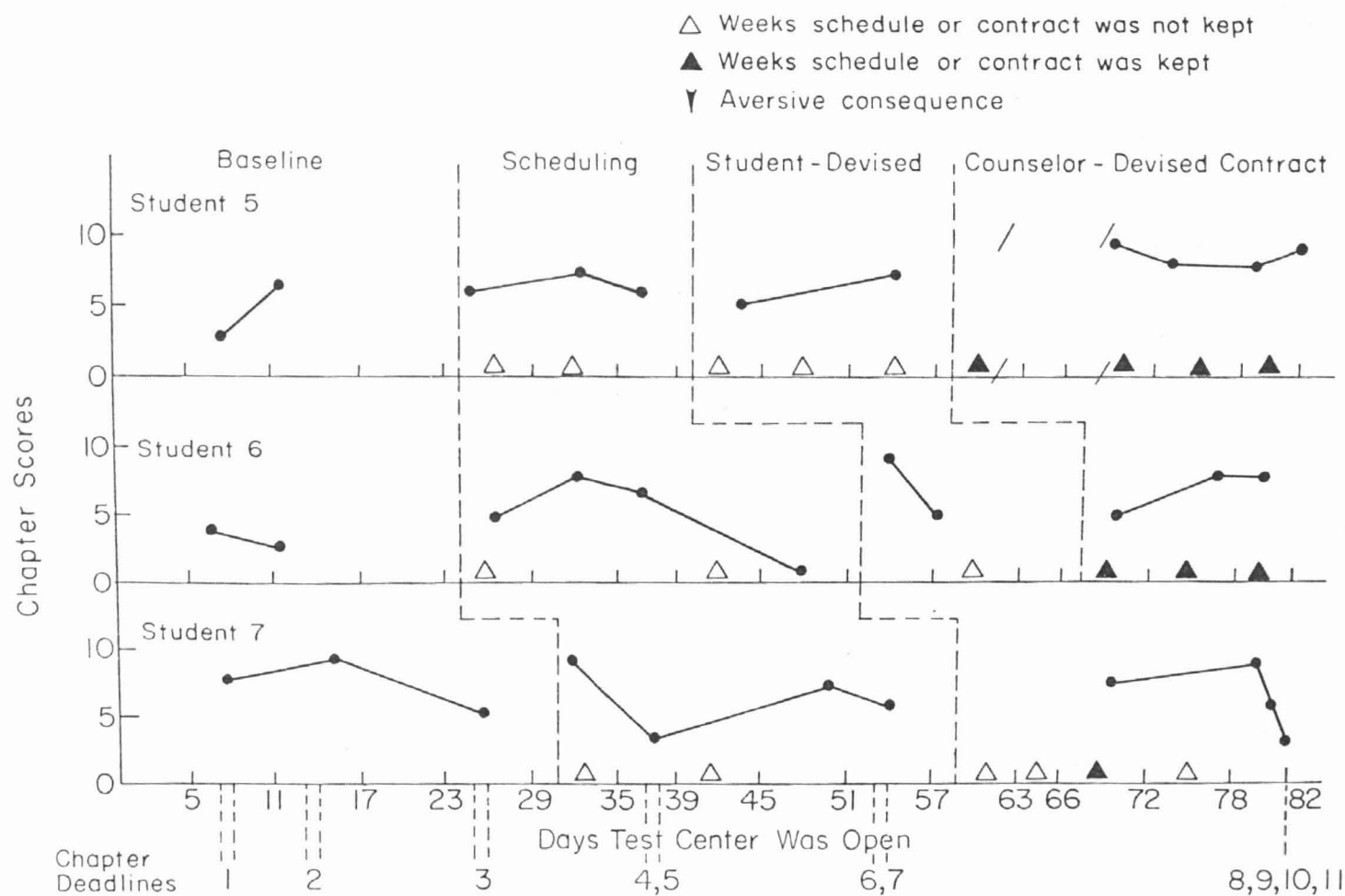


Figure 2. Total chapter scores plotted on the last day a test was taken over a given chapter as a function of baseline, scheduling, student-devised contingency contract, and counselor-devised contingency contract conditions with provisionally admitted university freshmen.

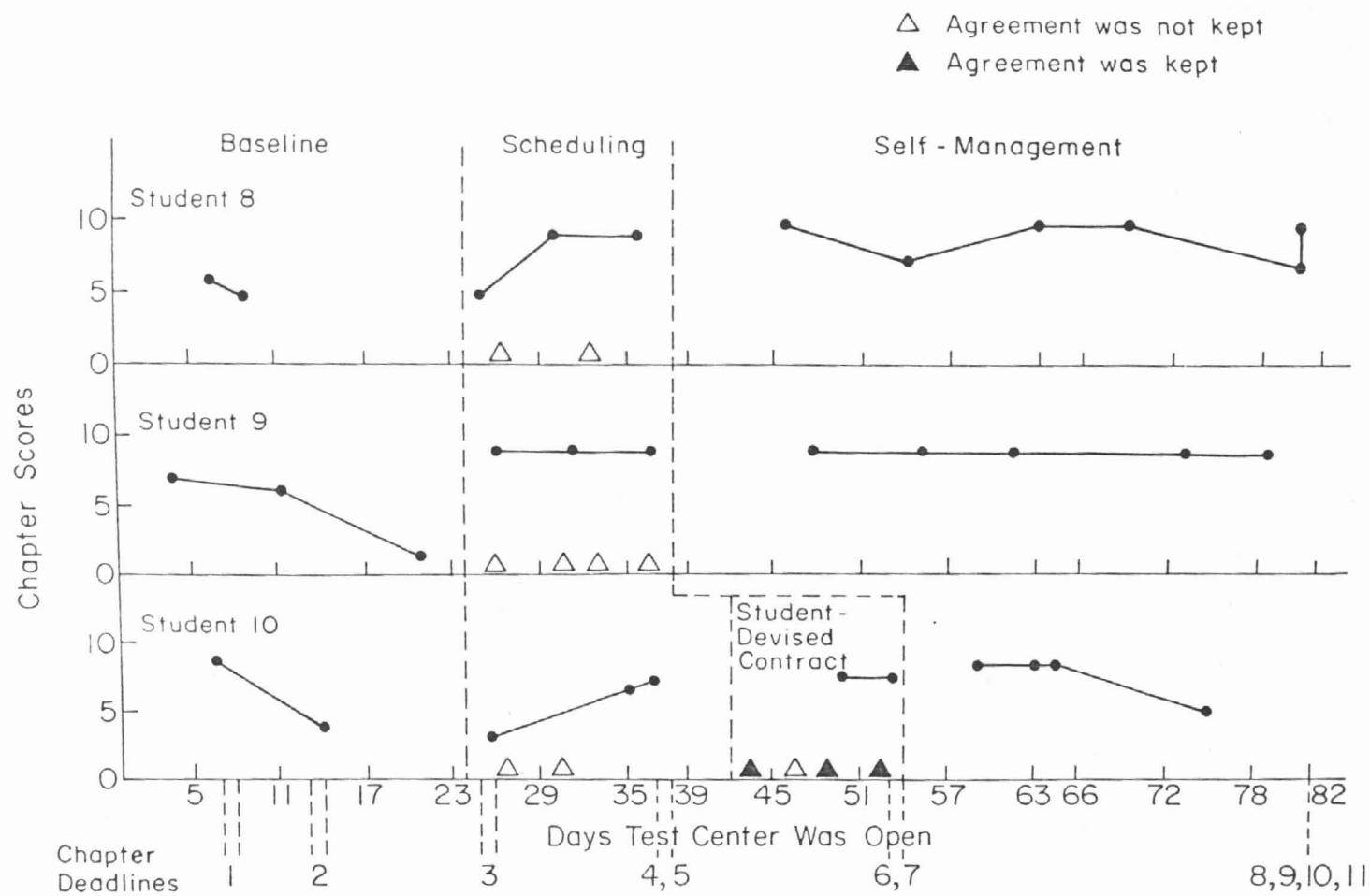


Figure 3. Total chapter scores plotted on the last day a test was taken over a given chapter as a function of baseline, scheduling, and student-devised contingency contract conditions with provisionally admitted university freshmen.

earned mean chapter scores of more than 7 points per chapter. Students 8 and 9 finished Psychology I during scheduling, and Student 10 finished Psychology I during student-devised contingency contracting.

Figure 4 shows chapter scores of Student 11 who earned 7 points on a chapter only twice during the entire semester.

Table 1 shows the percentage of tests which the students scheduled or contracted to take and then actually did take in each condition.

Condition 1. Data for the scheduling condition show that Students 5, 7, 8, and 9 took tests as scheduled 100% of the time, while the remaining seven students did not exceed 50% compliance with test schedules.

Condition 2. Under student-devised contingency contracting, four students fulfilled their contracts to take tests less often than in the previous condition, two more often, and one remained the same.

Condition 3. Data show that all four students who signed counselor-devised contingency contracts took tests as contracted 100% of the time.

These data suggest that contracts which contain an aversive consequence from an external source may be effective in inducing students to take tests.

Table 2 shows the percentage of library study periods the student attended as agreed upon (study periods attended

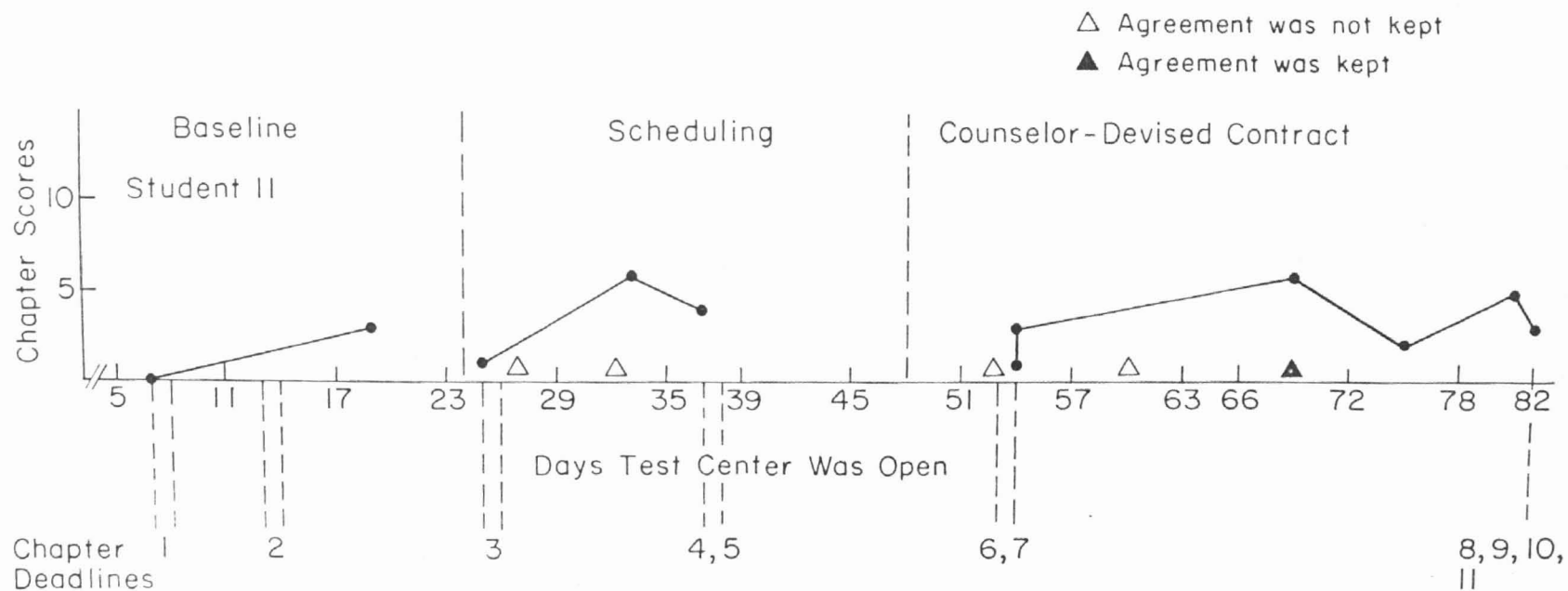


Figure 4. Total chapter scores plotted on the last day a test was taken over a given chapter as a function of baseline, scheduling, and student-devised contingency contract conditions with a provisionally admitted university freshman.

Table 1

Percent of Scheduled or Contracted Tests that were Actually Taken

Test Attempts	Student										
	1	2	3	4	5	6	7	8	9	10	11
Condition 1:											
Scheduled	2	3	2	5	2	3	2	3	3	2	3
Taken as scheduled	1	1	1	1	2	1	2	3	3	1	1
	50%	33%	50%	20%	100%	33%	100%	100%	100%	50%	33%
Condition 2:											
Contracted	5	3	2	/	3	1	5	/	/	4	3
Taken as contracted	1	0	1	/	1	1	2	/	/	3	1
	20%	0%	50%		33%	100%	40%			75%	33%
Condition 3:											
Contracted	3	/	3	/	4	3	/	/	/	/	/
Taken as contracted	3	/	3	/	4	3	/	/	/	/	/
	100%		100%		100%	100%					

Table 2
Percent of Study Periods Attended as Agreed

Study Periods	Student										
	1	2	3	4	5	6	7	8	9	10	11
Condition 1:											
Scheduled	1	2	3	5	2	2	2	2	4	2	2
Attended as scheduled	0	0	0	0	0	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Condition 2:											
Contracted	3	3	2	/	3	1	3	/	/	4	3
Attended as contracted	1	1	0	/	0	0	3	/	/	3	2
	33%	33%	0%		0%	0%	100%			75%	66%
Condition 3:											
Contracted	1	/	2	/	4	3	/	/	/	/	/
Attended as contracted	0	/	2	/	4	3	/	/	/	/	/
	0%		100%		100%	100%					

for less than the agreed amount of time were counted as nonattendance).

Condition 1. Data show 0% compliance with schedules to study in the library for all students.

Condition 2. Five of the eight students who devised contingency contracts for studying at least occasionally fulfilled them; however the remaining three students continued to show no compliance with agreements to study in the library.

Condition 3. Students 3, 5, and 6 fulfilled their contracts to study in the library when a counselor-devised aversive contingency was added to the contract. Only Student 1 did not meet his study contracts, and his behavior did not change after the aversive consequence was carried out.

These data suggest that an aversive consequence imposed by an external agent may be effective in inducing some students to fulfill study contracts.

Table 3 shows the percentage of lectures attended according to agreement.

Condition 1. It was necessary to schedule lectures for only Student 6, since the remaining students attended lectures regularly. The schedule to attend lectures was fulfilled twice. Further intervention was unnecessary.

None of the students fulfilled their weekly schedules during the scheduling condition; however 7 out of

Table 3
Percent of Lectures Attended as Agreed

Lecture Attendance	Student										
	1	2	3	4	5	6	7	8	9	10	11
Condition 1:											
Scheduled	/	/	/	/	/	2	/	/	/	/	/
Attended as scheduled	/	/	/	/	/	2	/	/	/	/	/
100%											
Condition 2:											
Contracted	/	/	/	/	/	/	/	/	/	/	/
Attended as contracted	/	/	/	/	/	/	/	/	/	/	/
Condition 3:											
Contracted	/	/	/	/	/	/	/	/	/	/	/
Attended as contracted	/	/	/	/	/	/	/	/	/	/	/

22 or 32% of the student-devised contracts were kept; and 9 out of 10 or 90% of the counselor-devised contracts were kept. These findings indicate that students are more likely to keep contracts with a counselor imposed consequence; however, with the possible exception of Student 5, there appears to be little correspondence between fulfillment of the contract and increase in chapter scores.

CHAPTER IV

DISCUSSION

Students were not required to keep their weekly counseling sessions with the author; therefore schedules and contracts were not made for the weeks that students did not attend their session.

Two of the eleven students completed at least one chapter per week with a score of seven or above with no intervention beyond scheduling. The performance of these students is not representative of the group. Possibly their histories of reinforcement differ from the other students. An analysis of these differences although valuable was beyond the scope of the present study.

With the exception of one student, none of the students met any element of their self-imposed contingency contracts. It is doubtful that the students actually carried out the specified contingencies whether they were reinforcing or aversive. Since the provisional status of many of these students may be attributable to a lack of motivation to apply self-control techniques, it should not be surprising that self-imposed contingencies did not control study behavior or test-taking. Self-reinforcement procedures might be successful with other student populations.

Contracts with counselor-imposed contingencies were more successful than either schedules or contracts with

self-imposed contingencies in motivating students to study and take tests. Unfortunately only four students took part in this condition, and the condition was instated near the end of the semester when scalloping is likely to occur anyway. Scalloping refers to an increase in the rate of a behavior, e.g. test-taking, near the end of the allotted time interval. Although decisive conclusions cannot be drawn from the results of this study, it is possible that contracts with counselor-imposed contingencies may be used to motivate students with whom other methods fail.

Although contracts with counselor-imposed contingencies appeared to control studying in the library and test-taking for three students; the increases in these behaviors were not accompanied by increases in chapter scores for two students. The methods used in this study placed the contingency on a behavior, i.e. sitting in the library and taking tests, rather than on the product of the behavior, i.e. chapter scores. The fact that behavior changed and the product did not, indicates that studying was not correctly defined. Sitting quietly with an open book does not mean that studying is taking place; it is a necessary but not a sufficient condition for studying.

The failure of these students' chapter scores to improve when studying increased is contrary to findings that test scores of below average students increase when studying increases (Bristol & Sloane, 1974). Although their

definitions for studying and observations were similar to those used in the present study, students were also required to meet with the experimenter weekly to describe the material they had studied as a precaution against faking study. Verbal discussions of course material is a suggested method of learning in some personalized courses (Ferster, 1974) and may account for the observed increase in test scores.

Studying may be better defined as reading, rereading, self-quizzing, outlining, and underlining. The first three behaviors are private events and therefore may only be self-observed and recorded. The remaining two behaviors also present difficulties for an observer because students tend to study at unpredictable times and places. A study report form has been successfully used as a self-report measure of these behaviors (Johnston, O'Neill, Walters, & Rasheed, Note 2).

Some of the above study behaviors may be more valuable than others, i.e. self-quizzing produces a better grade for less effort than rereading (Johnston et al., Note 2). A student who uses inefficient study tactics may spend more time to reach the same criterion as an efficient student. The study report form could be used by counselors in diagnosing problem study performance.

Counselors should bear in mind that a study report form is best used as a diagnostic tool, rather than a

behavior change technique. If counselors contract with students to use a study report form, the contingencies are placed on self-report; and it is likely that only the self-report will change, while the study behavior remains the same.

The present study shows that students will fulfill contracts with counselor-imposed contingencies; but suggests the contingencies must be placed on well defined and observed study behavior such as a verbal discussion of study material.

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APPENDIX A

Course Description of Psychology I

Tests

The student is required to take 10 tests during the semester, which he can take when he chooses provided he stays ahead of certain deadlines; i.e. after set dates, various tests will no longer be offered. E. G. Students must take chapter 1 by September 12.

Tests consist of 20 multiple-choice questions over one chapter of the textbook. A maximum grade of 10 points can be earned for each test, and a student may remediate twice.

Point Distribution

<u>1st attempt</u>		<u>2nd attempt</u>		<u>3rd attempt</u>	
19-20	10 pts	17-20	5 pts	17-20	3 pts
17-18	9 pts	14-16	2 pts	14-16	1 pt
13-16	4 pts	11-13	1 pt	below 14	0
10-12	3 pts	below 11	0		
below 10	0				

Discussion Sessions

Students may earn 20 points for attending a weekly discussion session. Sessions last seven weeks and meet once a week. Points are distributed for each discussion group as the instructor determines.

Lectures and/or films are available twice a week,
and the student can earn 1 point each for the first fifteen
attended.

APPENDIX B

Psychology I Study Schedule

Name _____

Date _____

Behavior	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
I will study in a carrel on third floor of Drake University Library	From _____ To _____	From _____ To _____	From _____ To _____	From _____ To _____	From _____ To _____	From _____ To _____	From _____ To _____
I will take the test on Chapter _____,							
if I do not score 9 points or over, I will remediate Chapter _____.							
I will attend the Psych I guest lecture or film							
I will attend the Psych I Chapter Review							

C O N T R A C T

Date _____

I, the undersigned, agree to perform the following behaviors:

Behavior	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
I will study in a carrel on the third floor of Drake University Library	From _____ To _____	From _____ To _____	From _____ To _____	From _____ To _____	From _____ To _____	From _____ To _____	From _____ To _____
I will take the test on Chapter _____.							
If I do not score 9 points or over, I will remediate Chapter _____.							
I will attend Psych I Chapter review.							
I will attend Psych I guest lecture or film.							
If I keep this agreement:							
If I do not keep this agreement:							

Signed _____

Signed _____